

先端科学技術研究科 修士論文要旨

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要旨			
<p>Autonomous Vehicle Stress (AVS) refers to the anxiety and discomfort passengers experience due to the unpredictability of autonomous driving systems. This research focuses on reducing AVS to improve passenger experiences in autonomous vehicles (AV) by enhancing system transparency. Passengers often perceive autonomous driving systems as "black boxes", leading to unpredictability and discomfort. Although existing studies emphasize safety and efficiency, they largely ignore the need to improve passenger understanding and comfort. This study addresses this gap by introducing an Augmented Reality (AR)-based "Explainer" to present structured data from autonomous driving systems in an easily comprehensible format. This method organizes data from the autonomous driving systems' Perception and Planning modules into causal and intentional information: causal information explains the physical cause-and-effect relationships between the vehicle's movements and its surroundings, while intentional information conveys the vehicle's objectives and intended actions.</p> <p>The goal is to provide passengers with a clear understanding of the vehicle's behavior, thus reducing AVS and enhancing their feelings of safety and control, leading to a more positive and comfort experience in AV. By delivering both causal and intentional information through AR, the Explainer aims to mitigate these stressors effectively.</p> <p>To validate the Explainer, an experiment with 28 participants was conducted using a static driving simulator equipped with visual and audio systems. Participants experienced different information presentation conditions, including AR and audio prompts. The results demonstrated that AR delivery of causal and intentional information significantly improved users' understanding, clarity, and overall satisfaction while reducing stress levels. These findings underscore the importance of comprehensive and immersive information delivery in enhancing the passenger experience in AV. The study concludes that the AR-based Explainer is crucial in effectively communicating the vehicle's actions and intentions, thereby reducing AVS and fostering a more positive and comfort passenger experience in autonomous vehicles.</p>			